UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,057	11/12/2003	Henry P. Moreton	NVDA/P000489	6349

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PATTERSON & SHERIDAN L.L.P.
595 SHREWSBURY AVE, STE 100
FIRST FLOOR
SHREWSBURY, NJ 07702

EXAMINER
NGUYEN, PHU K

ART UNIT	PAPER NUMBER
2628	

DATE MAILED: 03/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/706,057	MORETON, HENRY P.
	Examiner	Art Unit	
	Phu K. Nguyen	2673	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>12 November 2004</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-23</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-4,8-11,14-17 and 19-23</u> is/are rejected.

7)☒ Claim(s) <u>5-7,12,13 and 18</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

       1.☐ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____.

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

PHU K. NGUYEN
PRIMARY EXAMINER
GROUP 2300

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date <u>2/17/04</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over

SINHA et al. (5,014,230).

As per claim 1, Sinha teaches the claimed method for shaping a shared edge

between two patches comprising: "obtaining a first normal at a first shared vertex of the

shared edge for one of the two patches; obtaining a second normal at the first shared

vertex of the shared edge for another of the two patches" (Sinha, the normals of

surfaces S1 and S2; column 14, lines 36-37); and "computing a cross product for the

first normal and the second normal to provide a first tangent, wherein the tangent

provides a projection for determining the shared edge" (Sinha, the cross produce of two

normal vectors Nx(S1) X Nx(S2) is a vector belong to the tangent surface; column 14,

lines 41-42; column 21, lines 56-59; the tangent defines the shared edge of intersection

of two surfaces; column 27, lines 46-48). It is noted that Sinha does not teach surface's

patch is "N-patch" as claimed. However, Sinha's polygonal patch representing the

surface takes any types of general patch (Sinha, column 19, line 64 to column 20, line

8) including the well known N-patch. Thus, it would have been obvious to a person of

ordinary skill in the art at the timew the invention was made to apply Sinha technique on

N-patches of a surface because the simplification of N-patches in representing the

surface of object being displayed on a computer system (Sinha, col. 17, lines 58-59).

Claim 2 adds into claim 1 "using the first tangent to shape the shared edge" (Sinha, the tangent defines the shared edge of intersection of two surfaces; column 27, lines 46-48).

Claim 3 adds into claim 1 to further performing the vector calculation for another vertex on the shared edge (Sinha, the cross product is calculated for all point x on the shared edge; column 14, line 38; column 21, lines 56-59; the tangent defines the shared edge of intersection of two surfaces; column 27, lines 46-48).

Claim 4 adds into claim 1 (it should be depend on claim 3) "the second tangent provides another projection for determining the shared edge" (Sinha, the tangent defines the shared edge of intersection of two surfaces; column 27, lines 46-48).

Claim 10 adds into claim 9 "convertting the polygons to respective patch versions thereof" (Sinha, column 19, line 68). It is noted that Sinha does not teach surface's patch is "N-patch" as claimed. However, Sinha's polygonal patch representing the surface takes any types of general patch (Sinha, column 19, line 64 to column 20, line 8) including the well known N-patch. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply Sinha technique on N-patches of a surface because the simplification of N-patches in representing the surface of object being displayed on a computer system (Sinha, col. 17, lines 58-59).

Claim 11 adds into claim 10 "determining dot products for respective normal pairs at shared vertices" before generating the tangent which Sinha does not teach. However, Sinha does teach the decision of whether the normal vectors at the shared

vertex are identical (Sinha, column 10, lines 60-63). Thus, it would have been obvious

to a person of ordinary skill in the art at the time the invention was made to use the dot

product to test whether two unit vectors are identical because in basic geometry, since

the dot product of two unit vectors is cosin of the angle between them, then it their dot

product equals to one, then two unit vectors are identical.

As per claim 15, Sinha teaches the claimed method for shaping a shared edge

between two patches comprising: "providing a tessellator; providing an patch to the

tessellator; generating N-patches with the tessellator in response to the N-patch"

(Sinha, the further division or subdivision of the surface converses the model to a higher

form with more level of detail; column 19, lines 30-31); "identifying for two of the patches

a shared edge" (Sinha, the normals of surfaces S1 and S2; column 14, lines 36-37); and

"ascertaining whether the shared edge should be creased" (Sinha, column 10, lines 61-

62).). It is noted that Sinha does not teach surface's patch is "N-patch" as claimed.

However, Sinha's polygonal patch representing the surface takes any types of general

patch (Sinha, column 19, line 64 to column 20, line 8) including the well known N-patch.

Thus, it would have been obvious to a person of ordinary skill in the art at the timew the

invention was made to apply Sinha technique on N-patches of a surface because the

simplification of N-patches in representing the surface of object being displayed on a

computer system (Sinha, col. 17, lines 58-59).

Claim 16 adds into claim 15 "determining dot products for respective normal pairs

at shared vertices" before generating the tangent which Sinha does not teach.

However, Sinha does teach the decision of whether the normal vectors at the shared

vertex are identical (Sinha, column 10, lines 60-63). Thus, it would have been obvious

to a person of ordinary skill in the art at the time the invention was made to use the dot

product to test whether two unit vectors are identical because in basic geometry, since

the dot product of two unit vectors is cosin of the angle between them, then it their dot

product equals to one, then two unit vectors are identical.

Claim 17 adds into claim 16 "taking a cross product of the first normal and the

second normal at the common vertex of the shared edge, wherein a tangent vector is

generated, shaping the shared edge at least partially responsive to the tangent vector"

(Sinha, the cross produce of two normal vectors Nx(S1) X Nx(S2) is a vector belong to

the tangent surface; column 14, lines 41-42; column 21, lines 56-59; the tangent defines

the shared edge of intersection of two surfaces; column 27, lines 46-48).

As per claim 19, Sinha teaches the claimed method for shaping a shared edge

between two patches comprising: "obtaining a first normal at a first shared vertex of the

shared edge for one of the two patches; obtaining a second normal at the first shared

vertex of the shared edge for another of the two patches" (Sinha, the normals of

surfaces S1 and S2; column 14, lines 36-37. It is noted that Sinha does not teach

surface's patch is "N-patch" as claimed. However, Sinha's polygonal patch representing

the surface takes any types of general patch (Sinha, column 19, line 64 to column 20,

line 8) including the well known N-patch. Thus, it would have been obvious to a person

of ordinary skill in the art at the timew the invention was made to apply Sinha technique

on N-patches of a surface because the simplification of N-patches in representing the

surface of object being displayed on a computer system (Sinha, col. 17, lines 58-59).

It is noted that Sinha does not teach "computing a dot product of the first normal and the second normal". However, Sinha does teach the decision of whether the normal vectors at the shared vertex are identical (Sinha, column 10, lines 60-63). Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the dot product to test whether two unit vectors are identical because in basic geometry, since the dot product of two unit vectors is cosin of the angle between them, then it their dot product equals to one, then two unit vectors are identical.

Claim 20 adds into claim 19 "determining the shared edge is a line when the dot product is equal to one" which Sinha does not teach. However, Sinha does teach the decision of whether the normal vectors at the shared vertex are identical (Sinha, column 10, lines 60-63). Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the dot product to test whether two unit vectors are identical because in basic geometry, since the dot product of two unit vectors is cosin of the angle between them, then it their dot product equals to one, then two unit vectors are identical.

Claim 21 adds into claim 19 "a threshold" which claim 19 "determining the shared edge is a line when the dot product is equal to one" which Sinha does not teach. However, Sinha does teach the decision of whether the normal vectors at the shared vertex are identical (Sinha, column 10, lines 60-63). Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a

threshold to test the dot product of two unit vectors to decide whether they are identical

because in basic geometry, since the dot product of two unit vectors is cosin of the

angle between them, then it their dot product approximately equals to one, then two unit

vectors are almost identical.

Claim 22 adds into claim 19 "computing a cross product for the first normal and

the second normal when the dot product is not equal to one" (Sinha, the cross produce

of two normal vectors Nx(S1) X Nx(S2) is a vector belong to the tangent surface;

column 14, lines 41-42; column 21, lines 56-59; the tangent defines the shared edge of

intersection of two surfaces; column 27, lines 46-48).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 8-9, 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Sinha

et al. (5,014,230).

As per claim 8, Sinha teaches the claimed method for shaping a shared edge

between two patches comprising: "define the object in a higher order before calculating

the tangent of the shared edge" (Sinha, the further division of the surface converses the

model to a higher form with more level of detail; column 19, lines 30-31); "obtaining a

first normal at a first shared vertex of the shared edge for one of the two patches;

obtaining a second normal at the first shared vertex of the shared edge for another of

the two patches" (Sinha, the normals of surfaces S1 and S2; column 14, lines 36-37);

and "computing a cross product for the first normal and the second normal to provide a

first tangent, wherein the tangent provides a projection for determining the shared edge"

(Sinha, the cross produce of two normal vectors Nx(S1) X Nx(S2) is a vector belong to

the tangent surface; column 14, lines 41-42; column 21, lines 56-59; the tangent defines

the shared edge of intersection of two surfaces; column 27, lines 46-48).

Claim 9 adds into claim 8 "the model comprises polygons" (Sinha, col. 17, lines

58-59).

Claim 14 adds into claim 8 "the higher-order form of the model comprises Bezier

patches" (Sinha, column 19, lines 1-4).

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite

for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention.

Claim 4 recites the limitation "the second tangent" in line 1. There is insufficient

antecedent basis for this limitation in the claim.

Claim 21 and 23 are rejected under 35 U.S.C. 112, first paragraph, as failing to

comply with the written description requirement. The claim(s) contains subject matter

which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 21 adds into claim 19 "determining the shared edge is a line when the dot product is less than a threshold value," which is not clearly showed in the disclosure for a reasonable clarification. It is unclear as when two normal vectors at the shared vertex are clearly distinct, how can the shared edge is a line.

Claim 23 adds into claim 19 "computing a cross product for the first normal and the second normal when the dot product is greater than a threshold," which is not clearly showed in the disclosure for a reasonable clarification. It is unclear as when two normal vectors at the shared vertex are identical (their dot product equals to one and is greater than a threshold), then why a cross product is needed.

Claims 5-7, 12-13, 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance:

In claim 5, the allowable feature is "computing a modified tangent using at least the first tangent and the first shared vertex".

In claim 6 and its depend claim 7, similar claims 12-13, and claim 18, the allowable feature is "determining at least one control point."

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu K. Nguyen whose telephone number is (571) 272 7645. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (571) 272 7664. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Phu K. Nguyen
March 23, 2006

PHU K. NGUYEN
PRIMARY EXAMINER
GROUP 2300